

minute survey, crept away about 7 or 8 ft. off and sat down with its back to the snake. The other cat, a white one, now caught sight of the strange object, and, in a like stealthy manner, advanced to within a few inches of the gauze, and was in the act of examining the cobra, when my friend, to see the result of a sudden sound—for up to this time we had both been still as mice—moved his feet on the gravel. Had the effect been due to electricity, it would not have been more instantaneous, nor more startling. At the first grate of the pebbles the white cat flung himself backwards, tumbling—to use expressive terms—“heels over head” and “all of a heap” for about a couple of yards; whilst the black cat shot vertically upwards to somewhere near four feet in height, the impulse given by the spring of his hind legs being sufficient to throw these and his tail higher than his head.

Now both these cats are tame, and bold to such a degree that they reign supreme over all the dogs in the house, so that their great timidity on this occasion was evidently due to a perception of danger. I have since found, however, that all snakes are not equally feared by them. They will let the harmless green tree snake (*Passerita mycterizans*) twine round them without showing any signs of repugnance, and some other harmless snakes receive but little notice from them. Why is this? Is it that the hood of the cobra renders it so frightful an object, or have the cats in their nocturnal wanderings been struck at by cobras? Such is possible, for we know that in nine cases out of ten the strike is made without intention to exert the deadly power of the fangs. I believe indeed that unless irritated by an attacking enemy, or to secure active prey such as rats, &c., the cobra never strikes viciously. Experience of the ease with which its fangs are drawn and its helplessness without them would teach it to be careful of them.

Mangalore, Sept. 17

E. H. PRINGLE

Earthquake in New Guinea

WHEN crossing the main land of New Guinea, from the Geelvink Bay in the north, to the south coast, I slept on the night of the 12th to the 13th of June, 1873, in the swamps of the MacCluer Gulf (famous for the murder of some of the crew and the ship's doctor of H.M.S. *Panther* and *Endeavour*, Capt. MacCluer, in 1791, and by the attack on Signor Cerruti, the Italian traveller, several years ago). About 2 A.M. of the 13th I awoke, in consequence of a rattling noise like that of gun-shooting. I roused my six Malay companions, who slept around me in a small native prau, seized my guns, and listened to what would follow. But nothing happened. It was unintelligible to me what had been the cause of this noise, the natives of these parts having no guns, so far as I knew, and even if they had intended an attack, would not announce their arrival by firing their guns, instead of approaching in silence. On the other hand, when sleeping in a virgin forest like that which bordered these swamps, crashing noises from falling trees and from animals breaking down rotten branches often occur, but never so many together.

Nothing more being heard we fell asleep again. At about 4 A.M. the same thing happened once more. I remained awake. At dawn the Papoos, whom I had brought with me from the north coast—ten men—came back to my resting-place; they had left me, to sleep apart, had heard the noise, but could not understand it either.

When on the 13th I came back to Papooan houses at the River Takasi, which falls into the MacCluer Gulf—a minute description of which will be published very soon in “Petermann's Mittheilungen”—I heard the account of a heavy earthquake, which had taken place the night before; this of course explaining the noises we had heard: many trees having broken down at the same moment in consequence of the movement of the ground. We did not feel the earthquake in our small boat, because it lay entirely in the swamp, which had not propagated the shock.

On the 18th I was back at my little schooner, which was at anchor in the Geelvink Bay, near a place called Passim. The earthquake had been felt here at the same time, accompanied by heavy underground thunder, and I could make out that the direction had been N.W. to S.E.

After some days I came to a place just at the foot of the so much spoken of Arfak Mountains, called Audai; the earthquake had been heavy here, and even more shocks were felt on the following day. The direction had been W.E. Several native houses, built on very high poles near the slope of a hill, were

destroyed, the Papoos (Arfaks) still frightened and of opinion that the earthquake had been “made” by their enemies, another tribe on the mountains.

But in the Bay of Dorey, which has so often been visited by expeditions to New Guinea and by naturalists, where I arrived a fortnight later, the shocks appeared to have been the heaviest. All the Papoos in the different settlements there were living on shore in small shelters or huts, hastily erected, whereas they are known always to live in those large houses on the water so often described. Several of these large houses had broken down, and the natives were still very much frightened; they would not remove into their houses on the water. On the island of Manaswari (Mansinam), in the Bay of Dorey, the seat of a missionary, the shocks had been from S.W. to N.E. I afterwards sought information about the extent of this earthquake, and made out that it was felt at Amberbaki, on the North coast of New Guinea, at Salwatti, the island in the North-west, and on the island of Tobie, in the east. The centre had been undoubtedly on the Arfak Mountains. Light earthquakes sometimes occur in New Guinea, heavy ones seldom. The destruction by the last heavy one in 1864 could even be seen by me in 1873 along the sea-shore from Dorey to Wariab, and up the Arfak Mountains, in the south of the bay of Dorey. Volcanic eruptions in these parts are not known or recorded from earlier times. But one of the tops of these mountain chains bears in the native language the name of “Fire Mountain,” and some of my hunters pretended to have seen on one of their excursions (some thousands of feet high) the ground split open quite fresh, in consequence of the earthquake, as they believed.

This earthquake has not been felt in Halmabeira and the Molukkos Islands, where shocks occurred some weeks afterwards, so that the convulsions, referred to above, appear to have been local ones in New Guinea.

DR. A. B. MEYER

Sensitive Flames at the Crystal Palace Concerts

LAST Saturday, Jan. 31, at the Crystal Palace, while Mr. Vernon Rigby was singing Beethoven's “Adelaide,” I heard what I thought was strangely out of place—an accompaniment to the song played on the highest notes of a violin, sometimes closely following the air note for note, at other times being one-third lower. I soon found that this proceeded from one or two sensitive gas jets, notwithstanding they were at the end of the winter concert-room farthest away from the orchestra. The very perfect manner in which they responded to every note, no matter how *piano*, was curious.

It happened that the gas pressure had just been increased. Had this occurred earlier the effect of Mme. Norman-Neruda's fine performance of Mendelssohn's violin concerto would have been totally destroyed, as far as regards a large part of the audience. This shows that it is a matter of no small importance in a concert-room to have the size and number of the gas-burners properly proportioned to the gas supply.

King's College, Feb. 3

W. N. HARTLEY

THE PHOTOGRAPHIC SOCIETY

THE metropolitan photographic journals contain evidence that the Photographic Society of London is menaced with revolution or dissolution. If both were to befall it, the interests of Science would hardly suffer, since a more singularly inefficient organisation, under the guise of a scientific body, it would be difficult to find, or one whose results in the scientific world are so trivial.

It is difficult indeed to conceive that a society into whose hands, *faute de mieux*, the recognition and fostering of research in so important a branch of science as photography has fallen, should have done absolutely nothing for so many years but organise itself into a pocket borough in the direction of which no man of eminent scientific capacity takes part; which not only has no scientific reports or even investigations, but seems to care only to make of itself a weak mimicry of an art club. The chief objects of which are to prove that a photographer ought to have a chance for the Royal Academy, to discuss the most effective style of getting up portraits to

revive the trade demand, and to discuss such questions as to whether portraits may be re-touched or not, and whether the printing of a photograph from a half-dozen negatives, more or less, is to be regarded as a work of design or not.

It is not sufficient to put the names of two or three well-known men of science on the council of a society if the society show no care for science; and if the Photographic Society can do nothing more to merit the nominal position which it holds (without filling it), it is time that it should retire and give place to another. Photography has now become one of the most important aids to research in many fields of Science; every new discovery which shall develop this assistance and make its efficiency more complete is of importance to the whole world—of an importance which makes it almost incredible that the Photographic Society should not only take no part in the investigations which would lead to discovery, but should never even take recognition of them even when made, while the petty jealousies of the dominant clique have driven out of the society most of the really capable and successful investigators who have ever been in it. If the efforts at reform now being made should lead to success and the society become what it should be, a scientific body, so much the better; but if not, it is time that some new organisation should be formed to take in hand seriously the exploration of the still untried fields of chemical research, and make Photography a real branch of Science, and not deal with it merely as an amusement or a trade.

ASTRONOMY IN THE ARGENTINE CONFEDERACY

DR. GOULD, the director of the new Observatory in the Argentine Confederacy, continues to send encouraging accounts of the progress of the great astronomical works that he has there undertaken. Having laboured to determine accurately the relative brightness of all the stars in the southern heavens visible to the naked eye, he announces that a few weeks will enable him to begin the preparation of this work for publication. Great care has been taken to make a thorough and accurate comparison of the results of the four assistants, and the rule has been to determine the brightness of all the stars down to the 7·3 magnitude, in order to make sure of losing none as bright as the seventh.

The labour of the Uranometry was undertaken before the arrival of the large meridian instrument, and as soon as the latter was established (namely, on Sept. 9, 1872), the observations of the zones of all stars as bright as the ninth magnitude were commenced in earnest. Each night three zones are observed whose lengths average about one hundred minutes, the entire observations for the year occupying at least eight hours. The weather is described as having been exceedingly unfavourable for astronomical work during the winter and early spring, until March, April, and May of the present year, when magnificent opportunities were enjoyed. Dr. Gould states that he has observed in all during the past year about fifty thousand stars, and considers that somewhat more than half of the work of observing is already finished.

Astronomers, however, know how great a labour of computation still awaits Dr. Gould and his assistants before his results can be put into that form which is most convenient for use. The photographic work undertaken by him at his own private expense has been prosecuted with all the success that could be expected with a broken lens. Finally, however, he concluded to bespeak another object-glass, which will be purchased for the use of the observatory; and the new lens having arrived in perfect order, he hopes before long to be able to resume his labours under better auspices.

The Cordoba Meteorological Bureau, established by his urgent representation by the national Government,

has been organised and brought into working condition as rapidly as was practicable; but as the instruments were necessarily ordered from foreign countries, not more than half of them had arrived at the latest advices. Dr. Gould has, however, had the gratification of finding two gentlemen who have each carried on an uninterrupted series of observations for some dozen years past—one in Buenos Ayres, and the other near the Patagonian frontier—and he has secured the co-operation of about fifteen correspondents. The programme issued for the instruction of his observers differs apparently but little from that of the Smithsonian Institution, the hours of observation being seven, two, and nine, local time.

THE COMMON FROG*

IX.

THE muscles connected with the human lingual apparatus are sufficiently complex. One such muscle—the *stylohyoid*—passes downwards on each side, from a process of the base of the skull to the corniculum of the os-hyoides

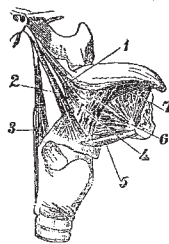


FIG. 63.



FIG. 64.

FIG. 63.—Muscles of the Right Side of the Tongue. 1, stylo-glossus; 2, stylo-hyoid; 3, stylo-pharyngeus; 4, hyo-glossus; 5, genio-hyoid; 6, genio-glossus; 7, lingualis.

FIG. 64.—Head of the Frog *Phyllomedusa*, showing the tongue fixed in front, but free posteriorly.

or tongue-bone. The tongue-bone of the frog is, as we have seen, relatively far greater than is that of man, and the same may be said for the muscles attached to it, since we have no less than four muscles descending from the skull, and implanted into it, on each side.

This fact might well be supposed to bear direct relation to the size and mobility of the frog's tongue. This organ in the frog and toad is singularly different from the tongues of most familiar animals, in that it is not free and moveable in front, but *behind*. These Batrachians take their food by suddenly throwing forwards, out of the mouth, the free hinder end of the tongue. The insect or other small animal struck by it, adheres to it, on account of a viscid saliva with which it is coated. The prey is then suddenly drawn into the mouth and swallowed.

Here then is a ready explanation of the development of the *os-hyoides* and its muscles. There is a difficulty however in that two toads already described, the Pipa and the African form *Dacylethra* (Figs. 11 and 12), have no tongue whatever.

Moreover, there is another toad (*Rhinophrynus*) which is even more exceptional in its order than these two; in that its tongue is not free behind, but, like that of ordinary vertebrates, in front (Fig. 13.)

The fact is, that the large tongue-bone of these animals serves, with the muscles attached to it, as much to facilitate respiration as nutrition.

It has already been said that the frog has no ribs by the elevation and depression of which it may alternately fill and empty its lungs. Neither does it possess that transverse muscular partition, the diaphragm, or midriff, which in man's class is the main agent in carrying on that function.

The lungs of the frog are inflated as follows:—The

* Continued from p. 189.